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Phocoena dioptrica.

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Phocoena dioptrica Lahille, 1912

Spectacled Porpoise, Marsopa de Anteojos

Phocaena dioptrica Lahille, 1912:269. Type locality "Punta Colares, cerca de Quilmes, Pcia. de Buenos Aires, Rio de la Plata, Rep. Argentina."

Phocaena stornii Marelli, 1922:229. Type locality "Tierra del Fuego."

CONTEXT AND CONTENT. Order Cetacea, Suborder Odontoceti, Superfamily Delphinoidea, Family Phocoenidae. The genus *Phocoena* now includes four species. No subspecies are recognized in *P. dioptrica*.

DIAGNOSIS. The original description of the holotype of *P. dioptrica* was based on an unique and distinctive color pattern. The dorsal surface and upper lateral surface to just above the eye is black, but the dorsal keel of the caudal stock is white (see figure 1). The dorsal surface of the flukes is black and the ventral surface is white with a gray border. The lower lateral surfaces and ventral surface are white. The eyes are surrounded by a wide black eye patch. The pectoral flippers are white and have a clear gray border, and a faint gray "flipper stripe" extends from the angle of the gape to the anterior insertion of the flipper. The general external morphology is as in other species of *Phocoena*, but *dioptrica* differs in having pectorals relatively smaller and rounded rather than pointed, and a large triangle shaped dorsal fin in adult males. The skull in general character is like that of *P. phocoena*, but differs as follows (see figure 2): 1) the dorsal surface of the rostrum is much more flattened, in lateral view the premaxillae are less visible; 2) in lateral view, the dorsal profile of the supraoccipital bone is in line with the dorsal profile of the rostrum instead of tilted at an angle of slightly more than 20°; 3) the condylobasal length of cranium (283 to 315 mm) is greater; 4) the cranium is broader; 5) the rostrum is more acute; and 6) the slope from the vertex of the skull to the nasal orifices is steep, in this resembling *Phocoenoides*.

GENERAL CHARACTERS. The only comparative description of the skulls of all four species of *Phocoena* is that of Norris and McFarland (1958). See also descriptions, measurements, and photographs of skulls of *P. dioptrica* in Marelli (1922), Hamilton (1941), and Praderi (1971). The left tympanic bulla and periotic bone of *P. dioptrica* are here illustrated (figure 4). Dentition ranges from 18 to 23 upper teeth on each side (nine specimens) and 16 to 19 lower teeth on each side (six specimens). The teeth are essentially uniform throughout (figure 3) and have spade-shaped crowns as in other species of *Phocoena*. Cabrera and Yepes (1940:300) erroneously reported the tooth count as 27 teeth on each jaw. Skeletons of the four species have not been compared, but Hamilton (1941) compared (and illustrated) some postcranial elements of *P. dioptrica* with those of *P. phocoena*.

External measurements are in Lahille (1912), Bruch (1916), Hamilton (1941), and Fraser (1968). Measurements reported by Bruch (1916) for an adult male and adult female, respectively, are (in millimeters): total length (tip of upper jaw to notch in flukes) 2040, 1860; tip of upper jaw to anterior insertion of the dorsal fin, 640, 600; center of anus to notch, 590, 545; center of eye to angle of gape, 100, 120; and to center of blowhole, 150, 185; dorsal fin height, 255, 150; and length, 445, 360; pectoral maximum width, 110, 70; girth at anterior insertion of pectorals, 810, 870; and at dorsal fin, 1020, 1080.

Lahille (1912), Hamilton (1941), and Fraser (1968) reported variations in color pattern, notably of the flippers and tail stock. The near term fetus from Lahille's specimen had a distinct flipper stripe and a lightly pigmented band extending between the blowhole and the tip of the rostrum. No postnatal specimen is known to have this latter band.

DISTRIBUTION. The species is known only from the western south Atlantic Ocean (figure 5). The northernmost record is from Balneario Lagomar (34° 52′ S), Uruguay (Praderi and Palerm, 1971). The southernmost record is from Tierra del Fuego (probably the Argentina sector); and individuals are also known from the Falkland Islands (Islas Malvinas) and South Georgia Island. No specimens are known from the center of the range along the coast of Argentina. *Phocoena dioptrica* is the only species of *Phocoena* that occurs around offshore islands.

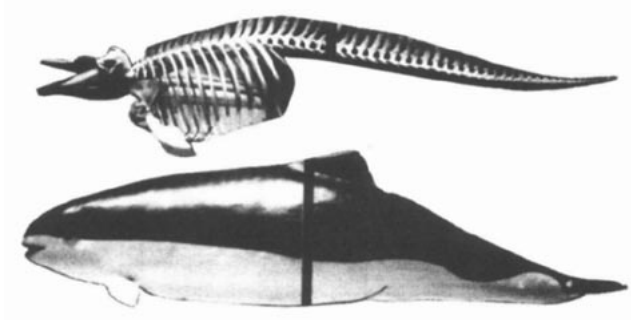

FIGURE 1. Skeleton and model of a specimen of *Phocoena dioptrica* in the Museo de La Plata (no. 1202). The vertical black bar is a mullion of the case enclosing the specimen and the horizontal lines seen through the thorax of the skeleton are on an ornamental column on the other side of the case. Photographs are all by the author. The total length was 1.86 m. The specimen was a female.

FIGURE 2. Photographs of dorsal (top) and ventral views of a skull of *Phocoena dioptrica*, Facultad de Humanidades y Ciencias, Montevideo, Uruguay (ZUCM 850). The condylobasal length is 297 mm.

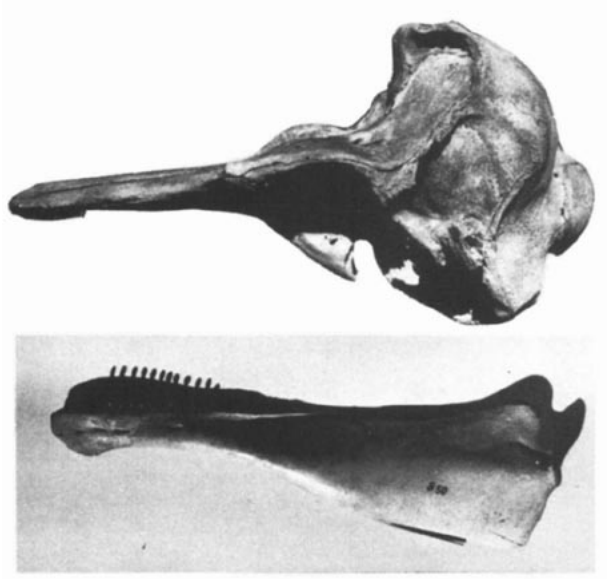

FIGURE 3. Photographs of side view of skull and lower jaw of *Phocoena dioptrica*, same specimen as shown in Figure 2. Scales are not identical. The mandible is 225 mm long. The shadow of teeth in mandible shows the spatulate shape well.

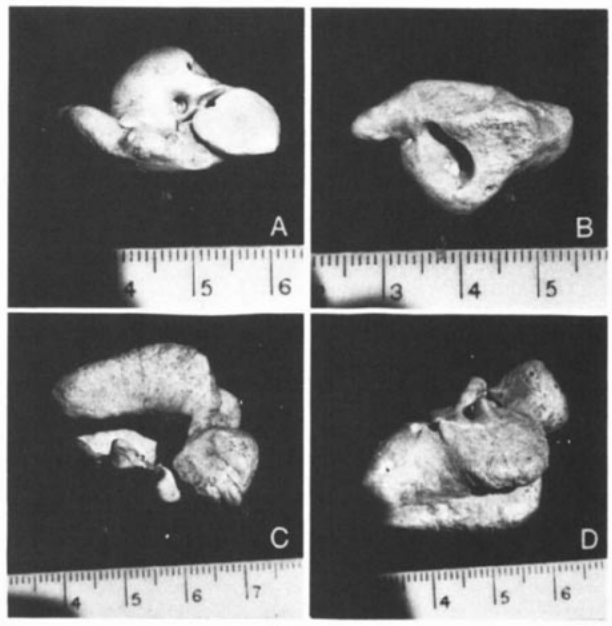

FIGURE 4. Ear bones of *Phocoena dioptrica* (ZUCM 850). A, right periotic in ventral view; B, right periotic in dorsal view; C, left tympanic bulla in dorsal view; D, left tympanic bulla in ventral view.

FOSSIL RECORD. The fossil record of *Phocoena* was discussed by Gaskin *et al.* (1974) in their account of *P. phocoena*. Barnes (1971) reported that phocoenid fossils indicated two lines of descent within the family. One gave rise to the recent genera *Phocoena* and *Neophocaena* and the other line to the recent *Phocoenoides*.

FORM. The vertebral count is: 7 cervical, 13 or 14 thoracic, 14 to 16 lumbar, and 32 or 33 caudal vertebrae, with at least 19 chevron bones. The first four or five cervical vertebrae are fused. The first nine ribs have capitular and tubercular attachments; posterior ribs are markedly flattened. Eight pairs of sternal ribs are present, and the anterior three are attached directly to the sternum. The phalangeal count (including the metacarpals) is: I-2, II-7, III-4, IV-3, and V-4 (Lahille, 1912). Aside from the vertebral count and phalangeal formula given for the holotype by Lahille (1912), the only osteological account is that by Hamilton (1941) of a complete immature skeleton and an incomplete adult (questionable) specimen. The nasal air sacs were described by Gallardo (1913) as were the larynx and hyoid bones. Other organ systems have not been studied. External descriptions are in Lahille (1912), Bruch (1916), Hamilton (1941), and Fraser (1968).

REPRODUCTION. The holotype, a pregnant female 1.91 m in total length, was obtained on 28 July 1912. The fetus was a female 484 mm in total length. Bruch (1916) reported another pregnant female, 1.86 m long, taken on 14 August 1912. No size was reported for the fetus, but Bruch stated that it was close to birth as was the one recovered from the holotype. Two males 2.00 m and 2.04 m in total length were reported to be adults because of their length and greatly enlarged dorsal fins (Bruch, 1916; Praderi and Palerm, 1971).

ECOLOGY. No endoparasites are recorded (Dailey and Brownell, 1972). Lahille (1912) reported that Dr. Carette would later prepare a paper on the parasites found in the holotype, but no such paper was ever published. No predators are known, but the killer whale, *Orcinus orca*, is a possibility. All of the known specimens of this porpoise were individual strandings or captures that occurred in May, July, August, September, or December. One porpoise stranded alive on South Georgia Island (Fraser, 1968). Nothing is known about the food habits or population numbers of *P. dioptrica*.

REMARKS. The holotype was collected by José de Gaetano and given to the Museo Nacional in Buenos Aires, now called the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACNBA). In the original description, Lahille (1912) compared *P. dioptrica* only externally with the other known species of *Phocoena*. No account was given of the skull, but the carcass must have been reduced to the bones as Lahille reported the vertebral number and phalangeal formula. In addition, the fetus was preserved in alcohol (MACNBA 12–14). On a number of occasions I have searched the mammal collections at the museum (MACNBA) in hopes of finding the holotype, but all of the osteological material from this specimen now seems to be lost. The fetus was described by Lahille and is still preserved. The diagnostic features of external coloration are evident on the fetus.

Only 10 occurrences are known of this species. There are three skulls with complete skeletons, one skull with an incomplete skeleton, two complete skulls, and two crania in museum collections. Praderi (1971) provided details on nine specimens.

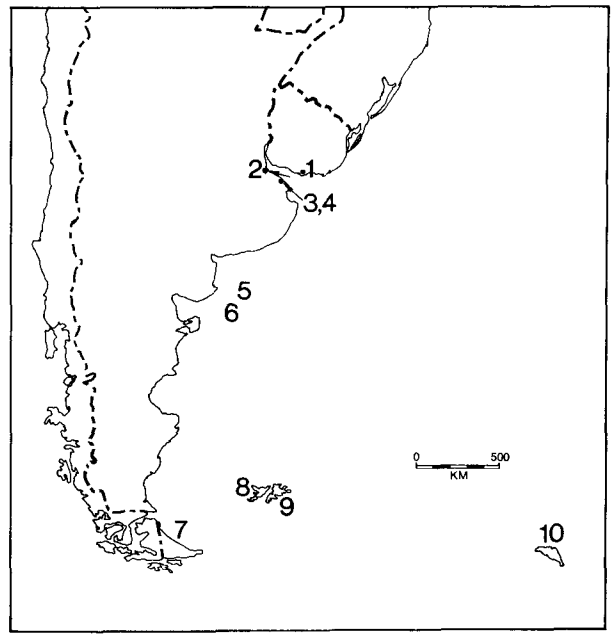

FIGURE 5. Map showing localities of 10 recorded specimens of *Phocoena dioptrica*: 1, 34°52′ S, 56°01′ W, Balneario Lagomar, Uruguay; 2, 34°45′ S, 58°15′ W, Punta Colares, Quilmes, Argentina; 3, 34°30′ S, 57°55′ W, Rio Santiago, Argentina; 4, same locality; 5, Atlantic coast, Argentina; 6, same area, likewise indefinite; 7, coast of Tierra del Fuego, Argentina; 8, West Falkland Island; 9, Falkland Islands; and 10, Leith Harbour, South Georgia Island.

A record for which no specimen exists was a stranding on the Falkland Islands (Hamilton, 1952).

Hershkovitz (1966) reported that the holotype of *Phocoena stornii* was "a skull only in the Buenos Aires Museum" (MACNBA). Hugo P. Castello has informed me that the holotype of *P. stornii* is a cranium only deposited in the vertebrate collections, Departamento de Biología, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires as no. M-116.

The specific name *dioptrica* is from the Spanish word *dioptrica* and probably referred to the black pigmentation around the eyes of the holotype and fetus. Nothing is known about the genetics or physiology of *P. dioptrica*.

Philippi (1893) described a peculiarly colored cetacean, *Phocoena obtusata*, that was collected from Bahia de Concepción, Talcahuano, Chile. The specimen was 1.50 m in total length, but no osteological materials were preserved. True (1903) stated "the shape of the fins and head suggest relationship with *Cephalorhynchus*, but the color-pattern does not agree." Disregarding this, Allen (1925) wrote "that Philippi's *Phocoena obtusata* is almost certainly a female of this last [*P. dioptrica*, Lahille, 1912] and his name should with little doubt replace *dioptrica*. His figure shows a similar form, with the same enormous dorsal fin, and the sharply defined white belly." The unusual feature of Philippi's *P. obtusata* was vertical bars of white entering the black dorsal field on its lateral sides. Allen (1925) suggested that this coloration was due to the folding of the skin in packing and shipment before being received by Philippi. Allen (1925) and Fraser (1968) stated that the black pectoral flipper is then the only important discrepancy between *P. obtusata* and *P. dioptrica*. Allen (1925) suggested that the flippers were discolored due to the poor state of preservation. Fraser (1968) noted that the flippers of the South Georgia Island specimen and the fetus from the type specimen were black or partially so. Fraser (1968) was not able to reach any conclusion and ended by stating: "Nevertheless, although the apparent discrepancy may have been accounted for, the general colour pattern of *P. obtusata* is so trenchantly different from that of *P. dioptrica* that it would be inadvisable, until further evidence is forthcoming, to give priority to Philippi's specific name and relegate *P. dioptrica* to the synonymy." Hershkovitz (1966) placed *P. obtusata* with question in the synonymy of *P. dioptrica*.

I have examined the holotype of *P. obtusata*, which is a poorly preserved carcass on public display in the Museo Nacional de Historia Natural in Santiago, Chile. In my opinion this specimen is a delphinid of the genus *Cephalorhynchus* as True (1903) stated and not *P. dioptrica*. My reasons are as follows: 1) the dorsal fin is not phocoenid in shape as figured by Philippi in his plate 3, figure 1 (1893), but its apex is rounded as in all known species of *Cephalorhynchus*, except *C. heavisidii* found in South African waters (Peter B. Best, personal communication, 1974); and 2) the shape of the flippers of *P. obtusata* are not like those of *P. dioptrica*.

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LITERATURE CITED

Allen, G. M. 1925. Burmeister's porpoise (*Phocaena spinipinnis*). Bull. Mus. Comp. Zool. 67:251–261.

Barnes, L. G. 1971. Comments on the Phocoenidae. Abstract, Geol. Soc. Amer. meeting in Riverside, California 3(2):79.

Bruch, C. 1916. El macho de *Phocaena dioptrica* Lah. Physis (Rev. Soc. Argentino Cien. Nat.) 2:461–462.

Cabrera, A., and J. Yepes. 1940. Mamíferos Sud-Americanos. Historia Natural Ediar. Co., Argentina Edit., Buenos Aires, 370 pp.

Dailey, M. D., and R. L. Brownell, Jr. 1972. A check list of marine mammal parasites. Pp. 528–589, *in* Mammals of the sea, biology and medicine. (S. H. Ridgway, ed.), Charles C Thomas, Springfield, 812 pp.

Fraser, F. C. 1968. Notes on a specimen of *Phocoena dioptrica* from South Georgia. British Antarct. Surv. Bull. 16:51–56.

Gallardo, A. 1913. Notas sobre la anatomia del aparato espiracular, laringe y hioides de dos delfines: *Phocaena dioptrica* Lahille y *Lagenorhynchus fitzroyi* (Waterhouse) Flower. An. Mus. Hist. Nat. Buenos Aires 24:235–245.

Gaskin, D. E., P. W. Arnold, and B. A. Blair. 1974. *Phocoena phocoena*. Mammalian Species 42:1–8.

Hamilton, J. E. 1941. A rare porpoise of the South Atlantic, *Phocaena dioptrica* (Lahille, 1912). Discovery Rep. 21:227–234.

— 1952. Cetacea of the Falkland Islands. Com. Zool. Mus. Hist. Nat. Montevideo. 4(66):1–6.

Hershkovitz, P. 1966. Catalog of living whales. Bull. U. S. Nat. Mus. 246:1–259.

Lahille, F. 1912. Nota preliminar sobre una nueva especie de Marsopa del Río de la Plata. An. Mus. Hist. Nat. Buenos Aires 23:269–278.

Marelli, C. A. 1922. *Phocaena stornii* sp. n., una nueva especie de marsopa del mar austral Argentino. An. Soc. Cient. Argent. 94:229–240.

Norris, K. S., and W. N. McFarland. 1958. A new harbor porpoise of the genus *Phocoena* from the Gulf of California. Jour. Mammal. 39:22–39.

Philippi, R. A. 1893. Los delfines de la punta austral de la América del sur. An. Mus. Nac. Chile, sec 1, Zool. 6:1–18.

Praderi, R. 1971. Contribucion al conocimiento del genero *Phocoena* (Cetacea, Phocoenidae). Rev. Mus. Arg. Cien. Nat., Buenos Aires, Zool. 7:251–266.

Praderi, R., and E. Palerm. 1971. Hallazgo de *Phocoena dioptrica* Lahille (Cetacea, Delphinidae), en la costa Uruguaya. Bol. Soc. Zool. Uruguay 1:19–21.

True, F. W. 1903. On species of South American Delphinidae described by Dr. R. A. Philippi in 1893 and 1896. Proc. Biol. Soc. Washington 16:133–144.

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